

receive an unlabeled data sample, wherein the unlabeled data sample is captured at least partially by the one or more sensors; and

perform inference using the decision tree model to predict the target variable for the unlabeled data sample.

23. A method of training a decision tree model, comprising:

allocating, in a memory, a tree node array for training the decision tree model, wherein the tree node array comprises a plurality of array elements, wherein a number of array elements in the tree node array is equal to a number of data samples in a training dataset;

receiving, via interface circuitry, the training dataset for training the decision tree model, wherein the training dataset comprises a plurality of data samples captured at least partially by one or more sensors;

training the decision tree model based on the training dataset, wherein:

a root node of the decision tree model is initially assigned to the data samples in the training dataset; the root node is recursively split into a plurality of child nodes based on a plurality of branch conditions identified for the training dataset, wherein each child

node is assigned to a corresponding subset of the data samples in the training dataset; and

the tree node array is continuously updated during training of the decision tree model to identify the child nodes assigned to the data samples in the training dataset, wherein each array element in the tree node array identifies a corresponding child node assigned to one of the data samples in the training dataset; and

storing the decision tree model in the memory.

24. The method of claim **23**, wherein:

a plurality of labels are assigned to the data samples in the training dataset; and

the decision tree model is trained to predict a target variable for unlabeled data samples based on the labels assigned to the data samples in the training dataset.

25. The method of claim **24**, further comprising:

receiving, via the interface circuitry, an unlabeled data sample, wherein the unlabeled data sample is captured at least partially by the one or more sensors; and

performing inference using the decision tree model to predict the target variable for the unlabeled data sample.

* * * * *